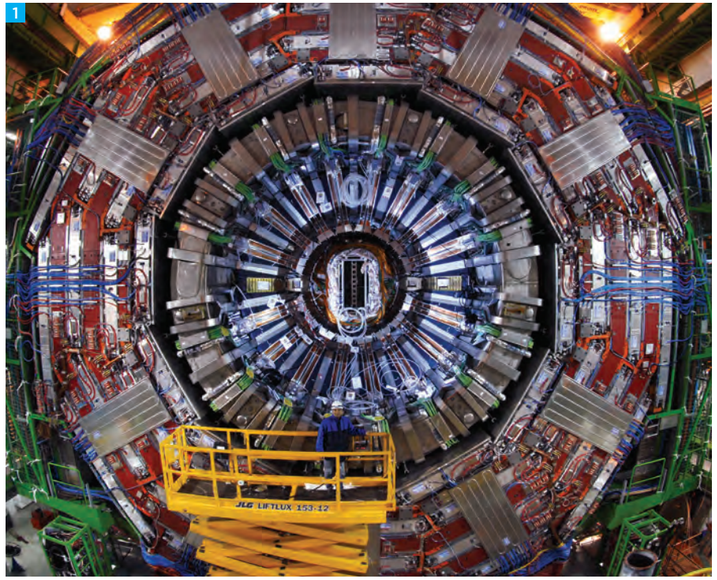
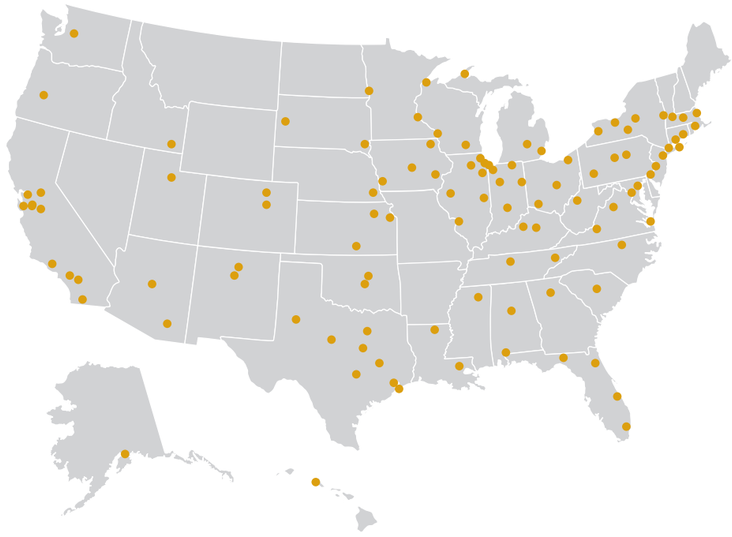


1. More than 1,700 U.S. scientists and students drive science forward through experiments at the Large Hadron Collider in Geneva, Switzerland, including using the CMS detector. **2.** High-energy physics partners with other scientific fields and agencies like NASA to push the boundaries of research through such experiments as the Fermi Gamma-Ray Space Telescope. **3.** The United States is a leader in the study of neutrinos, mysterious particles that may help explain why the universe has evolved to the form we know today. The MINOS experiment uses underground detectors in Illinois and Minnesota to study these particles. **4.** Computing tools and distribution systems created to process and analyze particle physics data have found their way into many areas of industry and society. **5.** National laboratories work with industry to train workers and develop manufacturing capabilities, such as building components for the next generation of particle accelerators.

High-Energy Physics Is a National Effort

Scientists, engineers, and technicians at **193 universities and laboratories in 44 states** build high-tech tools and components, conduct scientific research, and train and educate the next generation of innovators. High-energy physics facilities at laboratories in the United States attract more than 4,000 scientists from around the world every year.

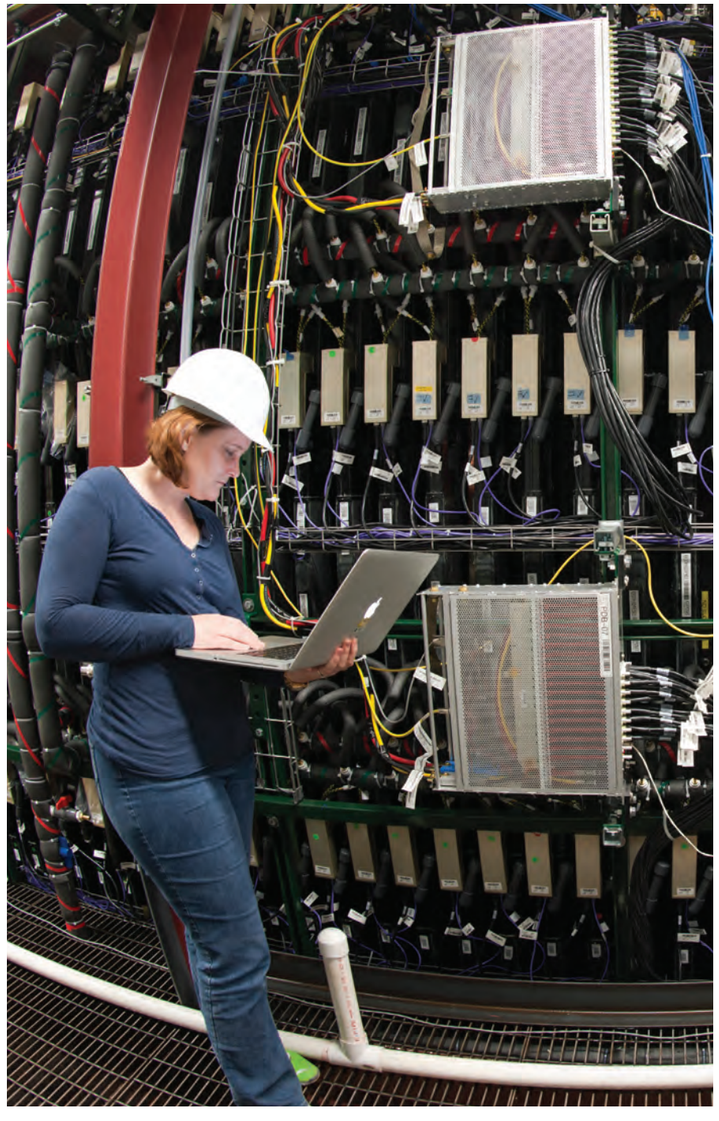


Please sustain funding for High-Energy Physics through the Department of Energy's Office of Science and the National Science Foundation to continue the process of innovation and discovery.

PRODUCED BY
THE DIVISION OF PARTICLES & FIELDS OF THE AMERICAN PHYSICAL SOCIETY

Accelerating National Innovation

High-Energy Physics in the United States



Our Exploration Propels U.S. Progress

The challenge of high-energy physics is to discover what our world is made of and how it works. Particle physics, the science of the very small, teams up with astrophysics and cosmology, the sciences of the very large, to explore the undiscovered universe from the outer reaches of space to the tiniest particles.

The quest to better understand our world inspires and educates tens of thousands of students across the country and creates a globally competitive, highly trained workforce in the United States. Advanced research and development (R&D) for the tools of **particle physics drives innovation that improves the nation's health, wealth, and security.**

"Truly transformational technologies do not come along every day, and cannot be readily predicted. But one thing is certain: if we do not invest in research and advanced training for scientists and engineers, they will not occur at all—at least not in the United States."

—Norman R. Augustine
Retired Chairman and CEO, Lockheed Martin Corporation
in testimony before the U.S. House Science Committee

Leading the World to New Discoveries

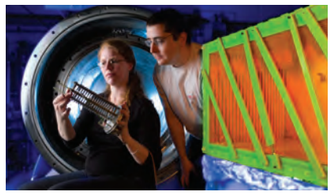
America's world-leading high-energy physics research program positions U.S. scientists to make the next generation of discoveries at home and abroad. **U.S. university and national laboratory researchers lead in the global search for answers to some of humankind's biggest questions:**

How did everything we see form in the early universe?
Research with powerful beams of neutrinos may provide an answer.

What are the building blocks of nature?
Particle physicists in the United States and around the world are hot on the trail of the Higgs boson and other, more exotic, possible particles.

How is the universe changing over time?
The world's largest galaxy survey will measure and trace the evolution of the cosmos.

What makes up the 96 percent of the universe we can't see?
We only understand four percent of our universe. Pioneering techniques to search for dark matter and dark energy could explain the rest.



High-Energy Physics Drives Innovation

High-energy physics discoveries require powerful research tools. These bold and innovative technologies have entered the mainstream of society to transform the way we live and do business. More than 30,000 particle accelerators are in use worldwide in industries including **medicine, manufacturing, and material processing.**

Examples of innovations enabled by high-energy physics R&D:

- Global communication through the World Wide Web
- Large-scale data management
- Cancer therapy with neutron and proton beams
- PET scanners and MRI machines
- Digital camera photo chips
- Ion-implanted silicon chips for electronic devices
- Greener radial tire production using electron beams

Providing a Unique Educational Tool

Every year, high-energy physics programs at universities and national laboratories give **tens of thousands of U.S. students hands-on learning experiences in science, math, computing, and engineering.** This connection with researchers and cutting-edge science and technology gives the U.S. workforce an edge in the high-tech global economy.

High schools in 20 states
use particle detectors in classrooms.

Teachers from 28 states
receive training and resources through the QuarkNet program, which connects physicists with schools.

38,000 students
attend educational activities at Fermilab, a national laboratory near Chicago, Illinois, solely dedicated to high-energy physics research.

90 percent
of people trained in high-energy physics put their skills to work in other areas such as industry and medicine.